CHAPTER VII. SOCIOECONOMIC AND BEHAVIORAL ISSUES IDENTIFIED THROUGH CASE-BY-CASE REVIEW

The association between low socioeconomic status, poor health and infant mortality is well-established.[4-9 11 12 23] Social, economic and political factors explain more of the differences in infant mortality than health service factors.[2] The context of socioeconomically deprived mothers' lives often includes low levels of education, lack of health insurance, and high levels of personal and environmental stressors associated with deprivation. These mothers are more likely than advantaged women to use substances during pregnancy, underutilize prenatal care, have housing problems and relationship problems, and experience domestic violence and other difficulties.

The most direct strategy to reduce infant mortality due to low socioeconomic status would be to guarantee a minimal standard of living for all and to improve living conditions, income, education and employment opportunities for the economically disadvantaged. However, this strategy requires far-reaching social change and is unlikely to occur in the short term. Additional strategies to mitigate the effects of social inequity are needed. To develop these strategies, a detailed understanding of the mechanisms through which social disadvantage produces poor health and infant death is needed. Once these mechanisms are understood, interventions can be designed to address them. The Infant Mortality Review is one tool to improve our understanding.

The Review collected information on a wide range of socioeconomic and behavioral factors including domestic relationships, social support of the mother, education, income and financial problems, stress, housing problems, lack of needed services, and substance use including smoking, alcohol and drug use. Problems with parenting, safety issues in the home, and involvement of Child Protective Service (CPS) were also studied.

The review committees often could not unequivocally determine that these factors were part of the chain of events leading an infant death. In part, this was due to the difficulty of concluding that these factors were causal in a specific case. The lack of research data concerning the role of socioeconomic and behavioral issues in causing health problems resulting in infant deaths added to this difficulty. Nonetheless, the occurrence of these factors was noteworthy because of their potential for causing adverse consequences for mothers and infants.

The high prevalence of these social factors and the interplay between the medical aspects of the cases and the social and behavioral issues uncovered by the Review raise important questions for further study.

Multiple social and behavioral factors often occurred in the same case, as the following vignette illustrates:

ILLUSTRATIVE VIGNETTE: Mary Jane had a history of abuse from childhood. She dropped out of school in tenth grade and became involved with alcohol and drugs. She was soon addicted to both. When she became pregnant, due to birth control failure, her boyfriend left her without any money. She tried working at minimum-wage job, but had to quit when she began to look pregnant on the job. She was homeless during her pregnancy, and had no family or friends to help her out. She delivered a premature infant when she was 26 weeks pregnant. Her only prenatal care had been one visit to a clinic. The baby died two hours after birth from complications of prematurity.

In this case the underlying cause of death was prematurity. Although a contributing factor was drug use, the associated factors were all socioeconomic or behavioral. They included: a history of abuse; low education; low income; substance use; unplanned pregnancy; unemployment; homelessness; and low social support. A health service related associated factor was inadequate prenatal care. As in many cases, the overwhelming daily stresses and unmet basic needs in Mary Jane's life combined to make her health and that of her fetus a low priority. The factors outlined in this vignette will be discussed in greater detail below.

The following sections describe the social, economic and behavioral issues found among women included in the Review. Table 7.17, at the end of this chapter, summarizes these issues.

LOW MATERNAL EDUCATION

Educational attainment is important as an indicator of the level of general knowledge of the mother and because of the relationship of education employment. Limited education has been found to be a risk factor for low birthweight, other poor birth outcomes,[10] and infant mortality.[23] Low education has been correlated with higher rates of smoking, less seat belt use, higher alcohol and drug abuse, failure to get children immunized, and lower incomes.[11] In an analysis of data from several countries, significantly elevated risks of dying throughout the first two years of life was associated with low maternal education.[12] In the Review, cases were considered "low education" if the education of the mother was eleven grades of schooling or less. A total of fifty-two cases (26 percent) met this criteria, a much higher number than among all King-County births (10.5 percent) .(See Table 7.1). This is highly significant.

TABLE 7.1
LEVEL OF MATERNAL EDUCATION: REVIEW CASES VS. ALL BIRTHS

Maternal Education	IMR Cases (%)	KC Births (%)*
≤11 Years	52 (25.7)	5,756 (10.5)
≥12 Years	150 (74.3)	49,163 (89.5)
Total	202 (100)	54,919 (100)
Unknown	45	12,415

THE ODDS RATIO FOR LOW EDUCATION FOR IMR CASES COMPARED TO ALL KC BIRTHS WAS 3.0 (95% CI: 2.1-4.1)
*DATA SOURCE: KING COUNTY BIRTH CERTIFICATES, 1992-1994

LOW INCOME

Income level is an important marker for determining the resources available to families not only for the basic needs of life such as food and housing but also for health care services. The growing number of infants and children in low income families in the United States has been an area of great concern in public health. These families are at risk for a variety of health problems, including increased risk of infant mortality and child death [1 2 4-9 11 12 23]. Women who are economically deprived are at risk for poor outcomes such as low birthweight and premature birth.[18] These two conditions account for approximately 75 percent of the nations' neonatal mortality.[19] Low income children have double the incidence of low birthweight compared to children of higher income.[4] Medicaid recipients have also been found to have higher rates of underweight birth and infant mortality than non-Medicaid sponsored women.[10] Low income pregnant women are nearly twice as likely as advantaged women to be uninsured and delay seeking prenatal care.[18]

In this report, low income was defined according to the Federal Poverty Guidelines. In 1994, 185 percent of Federal Poverty Level was $2,154 per month for a family of four. This threshold was used because in Washington pregnant women are considered Medicaid eligible at 185 percent of the federal poverty level. Eighty (46.5 percent) Infant Mortality Review cases had low incomes.

When compared with the King County population cases were much more likely to live in poverty. (Table 7.2)

TABLE 7.2
INCOME DIFFERENCES BETWEEN KING COUNTY POPULATION AND IMR CASES

Income Levels	IMR Cases (%)**	Total Population*
Less than or equal to 185% of Poverty	80(46.5)	259,615(17.6)
Greater Than 185% of Poverty	92(53.5)	1,217,447(82.4)
Total	172(100)	1,477,062(100)
Unknown	75	0

* SOURCE FOR KC TOTAL POPULATION IS THE 1990 CENSUS INCOME DATA
** INCOME INFORMATION FROM IMR CASE DATA SOURCES
THE ODDS RATIO FOR LOW INCOME FOR IMR CASES COMPARED TO KC TOTAL POPULATION WAS 4.1 (95% CI: 3.0-5.6).

LACK OF TRANSPORTATION

Transportation problems are more likely to be experienced with low income mothers, and difficulties with transportation have been cited as a major barrier to access to prenatal care.[8 9 18 20 21] Lack of transportation was listed as a factor when it was known to be a problem for the mother or affected the infant. For example, lack of transportation was noted when it interfered with accessing needed medical care. In this study, lack of transportation was under-reported, because only interviewed mothers were asked if transportation was a problem. Lack of transportation was cited as a known factor in only six cases (2.4 percent). In one case lack of transportation was considered to be contributory to the death because the infant was not taken for medical care soon enough. No car was available when the baby became ill.

LACK OF SOCIAL SUPPORT

Social support influences health seeking behaviors and may be a motivation for seeking prenatal care.[24] Social support also has a direct link with mental health because the unavailability of support when needed is strongly associated with depression in pregnant women.[24] Lack of social support and associated depression in pregnancy is increased in low income women.[25] Depression in pregnancy has been linked with poor outcomes such as low birthweight and prematurity.[25 26] Social support may also serve as a buffer against stress and help motivate women to adopt healthier behaviors. Social isolation and lack of social resources were recognized by the committee as important factors for the health and well-being of both mother and infant. An illustration of a family with low social support is described in the following example:

ILLUSTRATIVE VIGNETTE:
Irene and her family moved to King County during the pregnancy. They had moved frequently during the past few years and had lost contact with most of their relatives who lived on the East coast. The father worked long hours doing hard physical work. In the evening he usually liked to go out to play pool. He was often gone on weekends. He was unhappy about the pregnancy. The mother stayed at home all day with three small children. She had not made any friends in the neighborhood and did not belong to any organizations. When asked who were those that provided social support during the pregnancy, she cited her mother, with whom she spoke once or twice a month by phone, and her six year old daughter. The baby was healthy at birth but died of SIDS at three months of age.

Information concerning maternal social support systems was available primarily on the one hundred seventy-three cases (70.0 percent) who were interviewed. Assessment was done during the home interview to gather information on the number of people involved with the mother, frequency of the contacts or type of support available. A mother was considered to have low social support when she had only one or two people that she could list as friends or family who were supportive, and/or if contacts with these people were infrequent. Inadequate social support to assist with the duties of life and lend emotional support to the mother during the pregnancy and parenting was identified in 40 cases (24 percent of those for whom data were available).

DOMESTIC RELATIONSHIP PROBLEMS

Pregnancy is often a time when domestic violence begins or escalates,[27] and low income women are particularly at risk for verbal or physical abuse during pregnancy, as are pregnant women with health problems.[28] Nearly one in six of all adult pregnant women report abuse during pregnancy. Women who are abused during pregnancy have been found to be at risk for low birth weight, infections, anemia, smoking, use of alcohol or drugs and late entry into prenatal care.[10 28]

Problems in relationships between mothers and their spouses or partners during the pregnancy were frequent in cases reviewed, with a total of 75 reported occurrences. These problems included marital difficulties and poor relationships with partners (identified in 12 cases); uninvolved father of the infant (22 cases); mental, physical, sexual or emotional abuse (20 cases); and other related behavioral factors of the father including alcoholism, drug abuse, and abuse of other family members (3 cases). Marital difficulties and poor relationship with the father of the baby were most frequently evidenced by frequent arguments causing stress during the pregnancy. These numbers may be significantly underreported, as information was obtained only from interviewed women and some mothers may not have admitted to abuse during the interview.

Uninvolvement of the father was considered important because of the loss of social and financial support to the family. Fathers were absent from the household for several reasons. In three cases the father was unknown or uncertain. Additionally fifteen fathers were uninvolved with the mother and another four fathers were absent during the pregnancy.

TABLE 7.3
DOMESTIC RELATIONSHIP PROBLEMS (TOTAL IMR CASES = 247)

Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Marital difficulties/Poor relationship with partner	12	1	13	5.26%
Abusive relationship (mental/physical/sexual/emotional)	20	0	20	8.10%
Previous Mental/physical/sexual/emotional abuse	13	0	13	5.26%
Previous Domestic violence	3	0	3	1.21%
Previous Sexual assault	1	0	1	0.40%
Uncertain/unknown father of infant	3	0	3	1.21%
Father of infant uninvolved	15	0	15	6.07%
Father absenteeism	4	0	4	1.62%
Father: Alcoholic	1	0	1	0.40%
Father: Substance abuse: heroin	1	0	1	0.40%
Abuse of child by family member	1	0	1	0.40%
Total	74	1	75	30.33%

CHAOTIC LIVING CONDITIONS

Families with multiple social problems, disorganized lifestyles, evidence of social distress, and lack of resources were classified as having chaotic living conditions. A combination of unstable housing, domestic relationship problems (multiple partners, family arguments and fights) drug use in the home, and fragmentation of the family (including such factors as foster home placements and incarceration of the mother or absent partners) were typical of these cases. Because of the chaos, these families found it difficult to prioritize health and infant care. The effect on the infant death was often unknown, but the pattern of social distress was notable for its potential to affect maternal and infant health. Little is known of the interactions of these factors with infant mortality, although low birth weight and prematurity have been reported as significantly associated with maternal life events and stress.[29]

CHILD ABUSE AND NEGLECT

The Review did not consider cases where homicide was the suspected cause of death. The decision to exclude homicides from the Review was based on two facts. The first was that homicides comprise a very small number of King County infant deaths, averaging 1.4 annually. The second was a resource issue. Staff working on the Review could not be involved in the lengthy litigation and potential legal issues surrounding these cases. During the course of the Review of all other infant deaths in King County, we did not uncover any cases of substantiated abuse and neglect not already under the care of CPS.

CHILD PROTECTIVE SERVICE (CPS) INVOLVEMENT

The protection of children from abuse and neglect is the responsibility of Child Protective Services. The agency is designated to deal with the assessment and management of suspected and actual neglect and abuse of children.

Those families that had been reported to CPS in relation to the infant who died or other children in the family were classified as “involved with CPS.” It should be noted that systems for communication

between the Review and the CPS have emerged over time and data are unavailable for many of the early cases in the Review. The following numbers therefore underreport the occurrence of cases known to CPS.

A total of thirty-seven cases were known to have been involved with CPS. Twenty four of these were identified during the Review by the TRC. Ten of these were prior to the pregnancy with other children, four were during the pregnancy, and twelve were during the infants' life. Thirteen more cases of infant death were subsequently identified as having CPS involvement.

INCARCERATION

A total of six mothers were known to be incarcerated either during the pregnancy or following the birth of their infant. The incarceration separated the mothers from their families and support systems during pregnancy, and from their infants following delivery. The impact of incarceration on health services is discussed in Chapter VIII.

PROSTITUTION

The health and safety risks of prostitution for women of child bearing age are many. However gathering information from mothers concerning this activity is difficult due to the stigma associated with illegal activities. Documented prostitution was known in three cases, although a number of other mothers had a history of prostitution prior to this pregnancy and infant death. In one of the three cases, prostitution was considered contributory to the death of the infant because the baby died of sepsis due to infections acquired by the mother.

SUBSTANCE USE/ABUSE

Substance use and abuse during pregnancy including smoking, alcohol and illicit drug use has been associated with poor outcomes and elevated infant mortality rates.[30] [31] [32] [33] [34] Substance use is often difficult to document due to the social stigma associated with the use of alcohol and tobacco during pregnancy and the legal ramifications of the use of illicit drugs. Cases were identified as substance users if any amount of alcohol, drugs, or cigarette smoking occurred during pregnancy.

Ninety two mothers (38.2 percent) actively smoked during pregnancy and after birth, some exceeding two packs of cigarettes a day. Only 14.3 percent of the comparison group of all King County Births reported smoking cigarettes.

TABLE 7.4
MATERNAL SMOKING DURING PREGNANCY AND AFTER BIRTH (N=247)

Tobacco Use	IMR Cases (%)
Yes	92 (38.2)
No	149 (61.8)
Total	241 (100)
Unknown	6

We identified alcohol use during pregnancy in 63 (26.7 percent) cases. This number is much higher than that reported on birth certificates (3.9%), but birth certificate data on alcohol use in pregnancy are considered to substantially under-report alcohol use.

TABLE 7.5
MATERNAL ALCOHOL CONSUMPTION DURING PREGNANCY AND AFTER BIRTH (N=247)

Alcohol Consumption During Pregnancy	IMR Cases (%)
Yes	63 (26.7)
No	173 (73.3)
Total	236 (100)
Unknown	11

Illicit drug use was documented for 35 cases. No comparison group could be found for illicit drug use due to the lack of reporting and statistics available.

TABLE 7.6
MATERNAL ILLICIT DRUG USE DURING CURRENT PREGNANCY (N=247)

Drug Use	IMR Cases (%)
Yes	35 (14.8)
No	201 (85.2)
Total	236 (100)
Unknown	11

UNINTENDED PREGNANCY

Almost all women are at risk for unintended pregnancy during their reproductive years. However those at greatest risk of unintended pregnancies are women of low socioeconomic status, adolescents, and formerly married women. These women are at greater risk for both contraceptive non-use and for contraceptive failure.[35 36] Although the relationship of the intendedness of the pregnancy to pregnancy outcomes and infant death has not been well studied, it is known that an equal proportion of unintended pregnancies end in abortion (44 percent) as with birth (43 percent).[35] Maternal attitudes concerning intendedness of the pregnancy have been correlated with a two fold risk of the infant dying within the first 28 days of life.[37] A subsequent report will provide additional information concerning contraceptive use and intendedness of pregnancy in our cases compared to a control group of living infants.

Pregnancies were considered unintended if they were mistimed or unwanted. This information was gathered from mothers, either by interview or as available from records for non-interviewed mothers. Some pregnancies occurred due to lack of birth control use. Other unintended pregnancies were due to ineffective birth control methods or birth control failure. Unplanned pregnancy was present in one hundred twelve cases, (56.9 percent), compared 43.2 percent among all Washington births.

TABLE 7.7
PREGNANCY INTENTION

Pregnancy Intention	IMR Cases(%)	All Washington Births (%)*
Intended	85 (43.1)	701 (57.7)
Unintended	112 (56.9)	513 (42.3)
Total	197 (100)	1,214 (100)
Unknown	50	

THE ODDS RATIO FOR UNINTENDED PREGNANCY FOR IMR CASES COMPARED TO ALL WASHINGTON BIRTHS WAS = 1.8 (95% CI: 1.3-2.5)
* SOURCE: THE PREGNANCY RISK ASSESSMENT MONITORING SYSTEM (PRAMS) CONDUCTED BY THE WASHINGTON STATE DEPARTMENT OF HEALTH (PRELIMINARY DATA, APRIL 1995.)

HOUSING PROBLEMS

Housing difficulties during pregnancy have been linked with depression which in turn is related to prematurity and low birth weight.[25] Homelessness has been linked with poor birth outcomes for pregnant women, including low birth weight and higher rates of infant mortality.[38]

Families experienced multiple problems with housing. A total of 40 instances of housing difficulties were identified by the Review. These included homelessness during the pregnancy (21 cases), history of homelessness (3 cases), crowded housing (12 cases), home in unsafe condition (2 cases), unsafe neighborhood (4 cases) and being forced to move during pregnancy (1 case). While in most instances these were considered associated with the infant death, there were two instances in which crowded housing was assessed as contributing to the death. In both of these cases, the infant died accidentally from suffocation because the crowded living conditions precluded space for a crib in the residence.

TABLE 7.8
HOUSING PROBLEMS (TOTAL IMR CASES = 247)

Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Housing Problems	1	0	1	0.40%
Homelessness/frequent moves:	21	0	21	8.50%
Previous Homelessness	4	0	4	1.62%
Crowded housing	11	1	12	4.86%
Home unsafe/in poor repair	2	0	2	0.81%
Neighborhood unsafe	4	0	4	1.62%
Forced move in pregnancy	1	0	1	0.40%
Total	44	1	45	18.21%

PERCEIVED STRESS

The effects of stress on health and pregnancy outcomes are important but not well understood. Researchers have found that chronic stressors such as financial problems, parental worries and interpersonal conflicts are the most influential factors of poor mental health in low income women.[25] Links have been made in the literature between premature labor and stress.[39,40] A possible physiological mechanism for stress leading to premature labor is the stimulation by stress of the production of certain substances (corticosteriods and oxytocin) which can increase premature contractions of the uterus.[41] Stress may also cause the body to produce substances (corticosteroids) that make women more vulnerable to uterine infections such as chorioamnionitis.

The effects of stress on other birth outcomes are less well understood and may depend on the type, timing and duration of the stressful event. Chronic stressors appear to be more damaging than time limited stress.[25] The measurement of the degree of stress caused by certain life experiences is difficult because of individual differences in personality, life preferences, and economic and social resources.[42]

Because of the subjective nature of the perception of circumstances as stressful, we classified an event as stressful only if it was identified as such by the mother during the interview. Two thirds of all mothers were interviewed reported stressful events. Not all those who experienced difficulties cited these as stressful events. Stressful issues identified by mothers included concerns related to their pregnancy, economic worries, personal relationships, and violence . They have been clustered for discussion under the following categories: Domestic/Family Relationships; Financial; Occupational/Job Related; Medical/Pregnancy Related; Housing Related; Violence/Trauma; and Miscellaneous.

STRESS: DOMESTIC/FAMILY RELATIONSHIPS

This group of stressors is discrete from those cases where domestic and family relationship problems occurred. These cases are those where the mother stated she perceived stress due to the domestic and family relationship problems. Of all sources of stress, this was the single largest group with 74 occurrences. Relationship problems with partner or boyfriend (cited 29 times) were the single largest stressor in this grouping. Other factors in this group were general social situation/non-specified, stressful relationships with the mother, roommates, fear of abuse, partner absenteeism, and living away from home. Eight mothers cited the death of family or close friends. These losses are significant from a grief assessment standpoint, as they added additional loss close to the death of the infant.

TABLE 7.9
STRESS: DOMESTIC/FAMILY RELATIONSHIPS (TOTAL IMR CASES = 247)

STRESS: Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Domestic/Family Relationships	7	0	7	2.83%
History of abuse	3	0	3	1.21%
Partner absenteeism(away from home)	3	0	3	1.21%
Relationship (with partner/boyfriend)	33	0	33	13.36%
Social situation	5	0	5	2.02%
Death of friends/family	8	0	8	3.24%
Roommates	3	0	3	1.21%
Father alcoholic	1	0	1	0.40%
Visitors	1	0	1	0.40%
Poor social support	1	0	1	0.40%
Father drug use	1	0	1	0.40%
Drug use	2	0	2	0.81%
Substance abuse in household	1	0	1	0.40%
Caring for ill grandmother	1	0	1	0.40%
Parenting infant	1	0	1	0.40%
People moving in & out of household	1	0	1	0.40%
Total	72	0	72	29.15%

STRESS: FINANCIAL

A total of thirty instances of economic stress were identified by the interviewed mothers. Financial stress was identified by twenty-eight mothers. Two others identified insurance payment and a lawsuit as financial stressors.

TABLE 7.10
STRESS: FINANCIAL (TOTAL IMR CASES = 247)

STRESS: Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Financial	25	0	25	10.12%
Insurance	2	0	2	0.81%
Lawsuit	1	0	1	0.40%
Total	28	0	28	11.34%

STRESS: OCCUPATIONAL/JOB RELATED

Mothers cited their work as a major source of stress. Thirty four women felt that their jobs caused considerable stress. Four of these cases identified specific issues: long hours at work, high physical demands, conflicts with employers, and employer discrimination against a mother due to the pregnancy.

TABLE 7.11
STRESS: OCCUPATIONAL/JOB RELATED (TOTAL IMR CASES = 247)

STRESS: Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Job-related:	29	0	29	11.74%
Job-related: Long hours	1	0	1	0.40%
Job-related: High physical demands	1	1	2	0.81%
Job-related: Conflict with employer	1	0	1	0.40%
Job-related: Employer discrimination against pregnant woman	1	0	1	0.40%
Total	33	1	34	13.77%

STRESS: MEDICAL/PREGNANCY RELATED

A variety of concerns related to the pregnancy and medical or health related issues were identified, twenty-one in total. The largest group was mothers who had had long periods of bedrest due to preterm labor during their pregnancy. Additional pregnancy related stressors identified by mothers were twin pregnancies and self-monitoring of preterm labor. A range of other issues had single occurrences.

TABLE 7.12
STRESS: MEDICAL/PREGNANCY RELATED (TOTAL IMR CASES = 247)

STRESS: Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Lack of sleep	1	0	1	0.40%
Illness	1	0	1	0.40%
Bedrest for pregnancy	7	0	7	2.83%
Teen pregnancy	1	0	1	0.40%
Twin pregnancy	3	0	3	1.21%
Unwanted pregnancy	1	0	1	0.40%
Anxiety disorder	1	0	1	0.40%
Major depression	1	0	1	0.40%
Family history of ureter abnormalities	1	0	1	0.40%
Preterm Labor(PTL)	1	0	1	0.40%
Self-monitoring of PTL therapy	1	0	1	0.40%
Total	19	0	19	7.69%

STRESS: HOUSING ISSUES

Stress related to housing situation was cited during the interviews thirteen times. Issues identified ranged from homelessness/unstable housing, threatened eviction, and searching for a place to live, to moving during pregnancy, and remodeling the house.

TABLE 7.13
STRESS: HOUSING RELATED (TOTAL IMR CASES = 247)

STRESS: Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Moving	6	1	7	2.83%
Threatened eviction	2	0	2	0.81%
Search for housing, jobs	1	0	1	0.40%
Unstable housing/homelessness	2	0	2	0.81%
House remodel	3	0	3	1.21%
Total	14	1	15	6.07%

STRESS: VIOLENCE/TRAUMA

This group of stressors included: robbery, trial and sentencing of a mother, incarceration, street violence, gang activity , and sexual assault of a daughter. In a recent study, women who lived in violent neighborhoods were significantly more likely to experience pregnancy complications than women living in low violence neighborhoods.[45] Motor vehicle accidents occurring to pregnant mothers were also included in this group. These traumatically stressful events occurred ten times.

TABLE 7.14
STRESS: VIOLENCE/TRAUMA (TOTAL IMR CASES = 247)

STRESS: Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Robbery	2	0	2	0.81%
Trial and sentencing	1	0	1	0.40%
Incarceration	1	0	1	0.40%
Street violence	1	0	1	0.40%
Motor vehicle accident	2	0	2	0.81%
Gang activity	1	0	1	0.40%
Sexual assault of daughter/stepdaughter	2	0	2	0.81%
Total	10	0	10	4.05%

It was apparent during the interviews that mothers perceived that they had experienced significant stress during their pregnancies. The relationships among stress and infant mortality merit further study.

SOCIAL FACTORS FOLLOWING BIRTH

While all of the factors described thus far occurred both during pregnancy and after the birth of the infant, additional factors presented only during the infancy period. These factors were especially noteworthy because many of them were highly preventable. Issues and problems identified during the infant's life were in the areas of parenting skills, knowledge of caring for infants, and infant safety.

PARENTING SKILLS/KNOWLEDGE/SUPPORT

The three areas concerning parent knowledge and support were: general parenting skills, language barriers, and poor understanding of medical and health issues. General parenting issues included lack of involvement and maternal "bonding" with the infant following birth (2 cases). These were due to mental illness or drug use. Inadequate parenting skills were identified in three cases. Two of these were considered contributory to the infant deaths due to their relationship to health and inadequate safety of the infant. Lack of understanding of medical and infant health issues was associated with two infant deaths where the parents failed to recognize infant needs. Lack of parenting assistance was contributory in one case where fatigue of the parent resulted in inattentiveness to infant safety needs and the baby died an accidental death.

TABLE 7.15
PARENTING FACTORS (TOTAL IMR CASES = 247)

Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Inadequate parenting skills	1	2	3	9.09%
Lack of bonding/(lack of involvement with baby after birth)	2	0	2	6.06%
Poor patient (parent) medical understanding/knowledge	2	0	2	6.06%
Infant placed in foster care(Transgenerational foster care)	3	0	3	9.09%
Lack of parenting assistance	1	1	2	6.06%
Reckless driving	0	1	1	3.03%
Total	21	12	33	100.00%

INFANT SAFETY

Infant safety is the key issue in preventing unintentional injuries. Households contain many potential threats to infant safety. Unintentional injury, while comprising a small proportion of all infant deaths in King County, is preventable. Although much has been written about unintentional injury in children, few studies have examined these deaths in infants.[43] Since babies under 1 year are less mobile, hazards in the surrounding environment may be overlooked.[43] Prevention strategies should address safety issues for low income families living in substandard housing conditions; one study found resources, not lack of motivation, to be the limiting issue for economically deprived parents.[44]

Lack of safety in the home was manifested by a variety of problems. In some homes where safety concerns due to parenting were present; risk assessment was done by Child Protective Services. These were cases where excessive risks had been identified and reported to the agency as referenced in the above discussion on CPS. Additionally three cases were known to be in foster care following removal from the home due to parenting and infant safety concerns. A discussion of other identified infant safety concerns follows.

TABLE 7.16
INFANT SAFETY (TOTAL IMR CASES = 247)

Factored by the Technical Review Committee	Associated	Contributing	TOTAL	Percentage of All IMR Cases
Unsafe sleep environment	0	6	6	2.43%
Fall of Infant	2	0	2	.81%
Lack of car seat use	0	2	2	.81%
Total	2	8	10	4.05%

SLEEP ENVIRONMENT SAFETY

An unsafe sleep location has been identified as a major contributor to accidental infant deaths in the US. A study of infant deaths from unintentional injuries in Kentucky identified mechanically unsafe sleeping situations as the largest contributor.[43] In the Review, unsafe sleep environment was a contributing factor in four cases of accidental asphyxia in which the baby suffocated while asleep in dangerous locations, including defective cribs, adult beds and mattresses, and couches. Recommendations for sleep safety are contained in chapter VI.

AUTOMOBILE SAFETY

Placement of infants in car seats reduces motor vehicle related injuries and deaths among infants. Four of the infant deaths reviewed were due to automobile accidents and two of these infants were not in car seats. Lack of car seat use was considered contributory to these two deaths. In addition to the lack of a car seat, reckless driving was also contributory in one case.

FALLS

Undocumented accidental falls were known by the committee to occur among infants with some unknown frequency. However, infant falls were identified in two cases, where the baby was taken for emergency treatment.

SAFETY RECOMMENDATIONS

Recommendations for sleep safety are contained in chapter VI. Other recommendations to assure the safety of infants are to:

- Plastic bags should be out of the reach of infants at all times.
- Window blind cords should be out of reach of infants at all times and cords should have no loops.
- An approved infant car seat should be used at all times when transporting the baby by car. We support the current Washington State law that requires that infants be placed in car seats when in a vehicle.

CONCLUSIONS

The association between low socioeconomic status, poor health and increased infant mortality has been documented in both scientific literature and this Infant Mortality Review. Compared to all King County births, women who suffered infant deaths were more likely to be socioeconomically deprived and have low educational attainment. Many of these women experienced a broad range of stressors coupled with domestic relationship problems, chaotic living conditions and low social support. Fathers were uninvolved or absent in many cases. The high rate of unintended pregnancy found in this study indicates that women are still experiencing a lack of control over their lives.

The dynamics and interrelatedness of socioeconomic issues such as low income and education, unstable or unsafe housing and living conditions, unintended pregnancy, lack of social support, domestic relationship and violence problems, substance use, and chronic stress appear to be important contributors to adverse outcomes for mothers and their infants and warrant further study. In this report, we have reviewed these factors as discrete factors, but in reality they are interrelated steps in the path to poor health outcomes. More study of socioeconomic inequity and behavioral issues as important risk factors in infant mortality is needed to guide future prevention strategies.

TABLE 7.17
SUMMARY TABLE OF ASSOCIATED AND CONTRIBUTORY SOCIOECONOMIC AND BEHAVIORAL ISSUES IDENTIFIED BY THE INFANT MORTALITY REVIEW(TOTAL IMR CASES = 247)

Factored By The Technical Review Committee	Associated	Contributing	TOTAL	% of IMR Cases
Lack of transportation	6	0	6	2.43%
Lack of social support	40	0	40	16.19%
Domestic relationship problems	74	1	75	30.36%
Chaotic living conditions	15	0	15	6.07%
Incarceration	6	0	6	2.43%
Prostitution	2	0	2	0.81%
Housing problems	43	1	44	17.81%
Stress: Domestic/Family relationships	72	0	72	29.15%
Stress: Financial	28	0	28	11.34%
Stress: Occupational/Job related	33	1	34	13.77%
Stress: Medical/Pregnancy related	19	0	19	7.69%
Stress: Housing related	14	1	15	6.07%
Stress: Violence/Trauma	10	0	10	4.05%
Stress: Miscellaneous	7	0	7	2.83%
Parenting factors	21	12	33	13.36%
Infant safety	2	8	10	4.05%
Total	386	24	410	

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